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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,411	03/18/2004	Colin N. Gunn	6270/138	5554

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EXAMINER	
BARAN, MARY C	

ART UNIT	PAPER NUMBER
2857	

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/803,411	GUNN ET AL.
	Examiner	Art Unit
	Mary Kate B. Baran	2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27,34-53 and 59-84* is/are pending in the application.

4a) Of the above claim(s) *34-48 and 77-84* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18,20,21,24-27,49-53,59-64 and 67-76* is/are rejected.

7)☒ Claim(s) *19,22,23,65 and 66* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/23/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The action is responsive to the Amendment filed on 27 January 2006. Claims 1-27, 49-53 and 59-76 are pending. Claims 34-48 are both amended and withdrawn. Claims 28-33 and 54-58 are cancelled. Claims 59-76 are new. Claims 34-48 and 77-84 are withdrawn.

Election/Restrictions

2. Newly submitted claims 77-84 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claims 77-84 recite the same limitations as original claims 54-58, which are non-elected claims from the previous action.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 77-84 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP§821.03.

Claim Objections

3. Claim 61 is objected to because of the following informalities: claim 61 page 10 line 2, "couple" should be – coupled –. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-18, 20, 21, 24-27, 49-53, 59-64 and 67-76 are rejected under 35 U.S.C. 102(b) as being anticipated by Bullock (U.S. Patent No. 5,066,904).

Referring to claims 1 and 49, Bullock teaches an apparatus for sensing the current in a power line of a power system (see Bullock, column 1 lines 9-12), the apparatus comprising: an enclosure providing a window operable to permit the passage of said power line therethrough (see Bullock, column 7 lines 22-26); an active current transformer set within said enclosure and operative to produce a scaled version of said current (see Bullock, column 7 lines 39-44); an amplifier coupled with said active current transformer and operative to reduce the phase shift and ratio error between said current and said scaled version of said current (see Bullock, column 5 lines 35-42); a powering current transformer set within said enclosure and operative to receive power from said power line on a primary winding and deliver power on a secondary winding (see Bullock, column 7 lines 45-52); power supply circuitry set within said enclosure, said power supply circuitry powered through said secondary winding from said powering current transformer and operative to supply power to said amplifier (see Bullock, column 7 lines 53-65); and at least one of secondary leads and secondary terminals extending from said enclosure, coupled with said active current transformer and operative to

deliver said scaled version of said current outside of said enclosure (see Bullock, Figure 3); and power supply circuitry set within said enclosure, said power supply circuitry operative to extract power flowing within a second range of frequencies through said at least one of secondary leads and secondary terminals, said power supply circuitry operative to supply power to said amplifier (see Bullock, column 17 line 56 – column 18 line 40).

Referring to claim 2, Bullock teaches a burden set within said enclosure and coupled across said at least one of secondary leads and secondary terminals (see Bullock, column 17 lines 15-25).

Referring to claim 3, Bullock teaches that said amplifier is configured so that the absolute value of said phase shift is below 0.05 degrees when said apparatus is operated over a dynamic range of 50 to 1 of said current to said scaled version of said current (see Bullock, column 5 lines 35-42).

Referring to claim 4, Bullock teaches that said amplifier is configured so that the ratio error is below 0.1% when said apparatus is operated over a dynamic range of 50 to 1 of said current to said scaled version of said current (see Bullock, column 5 lines 35-42).

Referring to claim 5, Bullock teaches that said amplifier is configured to generate a compensation current which zeros the flux in a sense coil within said active current transformer (see Bullock, column 8 lines 2-6).

Referring to claim 6, Bullock teaches a secondary coil within said active current transformer (see Bullock, column 7 lines 59-61); a current divider coupled to said secondary coil (see Bullock, column 8 lines 54-59); wherein said current divider is configured to feed a portion of said compensation current into said secondary coil (see Bullock, column 8 lines 2-6).

Referring to claim 7, Bullock teaches a shunt coupled with said secondary winding and operative to carry at least a portion of an output current of said secondary winding (see Bullock, column 7 lines 15-20).

Referring to claim 8, Bullock teaches a regulator coupled with said shunt and operative to regulate the flow of current through said shunt (see Bullock, column 9 lines 24-32).

Referring to claims 9-11, Bullock teaches a microcontroller operative to sense a current in said secondary winding, and based on said current in said secondary winding, operate said shunt in a linear (see Bullock, column 17 lines 26-38) or switched regulation mode (see Bullock, column 17 lines 56-60).

Referring to claim 12, Bullock teaches that said switching regulator comprises a microcontroller (see Bullock, column 17 lines 61-63).

Referring to claim 13, Bullock teaches a detector operative to detect when said amplifier is unable to reduce said phase shift and ratio error by an expected amount (see Bullock, column 5 lines 35-42).

Referring to claim 14, Bullock teaches an indicator operative to indicate said detection (see Bullock, column 5 lines 35-42).

Referring to claim 15, Bullock teaches that said power supply circuitry is operative to provide power to a device external to said apparatus (see Bullock, column 1 lines 9-17).

Referring to claim 16, Bullock teaches a bridge rectifier coupled with said secondary winding and operative to provide a rectified output current from an output current of said secondary winding (see Bullock, column 18 lines 2-9); a shunt coupled with said bridge rectifier and operative to selectively shunt current from said secondary winding (see Bullock, column 7 lines 15-20); an energy storage device operative to receive a portion of said rectified output current that is not shunted by said shunt (see Bullock, column 18 line 2-9); a regulator operative to sense a voltage of said energy

storage device and turn said shunt off when said voltage is below a first threshold and turn said shunt on when said voltage is above a second threshold (see Bullock, column 17 line 56 – column 18 line 9).

Referring to claim 17, Bullock teaches a comparator (see Bullock, column 10 lines 59-66).

Referring to claim 18, Bullock teaches a microcontroller (see Bullock, column 17 lines 61-63).

Referring to claim 20, Bullock teaches that said voltage power said microcontroller (see Bullock, column 17 lines 61-66).

Referring to claim 21, Bullock teaches a MOSFET (see Bullock, column 17 lines 56-60).

Referring to claims 24 and 25, Bullock teaches a sense core and a secondary core; said sense core mounted within a groove formed in said secondary core (see Bullock, column 7 lines 45-52).

Referring to claim 26, Bullock teaches that active current transformer comprises said powering current transformer (see Bullock, column 7 lines 39-65).

Referring to claim 27, Bullock teaches that at least one of secondary leads and secondary terminals are configured for interconnection to an intelligent electronic device (see Bullock, column 10 line 68 – column 11 line 3).

Referring to claim 50, Bullock teaches that said first range is 4 kHz and below and said second range is 400 kHz and above (see Bullock, column 17 lines 39-44).

Referring to claim 51, Bullock teaches that said first range covers a frequency range at lower frequencies than said second range (see Bullock, column 17 lines 39-44).

Referring to claim 52, Bullock teaches that said at least one of secondary leads and secondary terminals are operative to deliver said scaled version of said current in the form of digital data (see Bullock, column 7 lines 39-44).

Referring to claim 53, Bullock teaches that said at least one of secondary leads and secondary terminals are operative to deliver said scaled version of said current in the form of a scaled current signal (see Bullock, column 7 lines 39-44).

Referring to claims 59, 69 and 70, Bullock teaches an apparatus for sensing the current in a power line of a power system (see Bullock, column 1 lines 9-12), the

apparatus comprising: an active current transformer that includes a secondary coil wound on a secondary core, wherein the secondary core is operable to be magnetized with a power line and the secondary coil is operable to supply a load (see Bullock, column 7 lines 53-65); a compensation circuit operable to compensate for magnetic losses in the secondary core (see Bullock, column 7 line 66 – column 8 line 8); a power supply circuit having a supply rail, wherein the power supply circuit is operable to regulate the supply rail in one or a switched regulation mode and linear regulation mode to supply power to the compensation circuit from the supply rail (see Bullock, column 17 line 39 – column 18 line 9); and a powering current transformer that includes a power coil wound on a power core, wherein the power core is operable to be magnetized with the power line and the supply rail is powered from the power coil (see Bullock, column 7 lines 45-65).

Referring to claim 60, Bullock teaches a microprocessor and a regulator, wherein the microprocessor is operable to regulate voltage on the supply rail in the switched regulation mode and the regulator is operable to regulate voltage on the supply rail in the linear regulation mode (see Bullock, column 17 lines 26-38 and column 17 line 56 – column 18 line 9).

Referring to claims 61 and 72, Bullock teaches a shunt switch coupled between a ground connection and the supply rail (see Bullock, column 7 lines 15-20), the shunt switch selectable to be one of open and closed during the switched regulation mode,

and the conductivity of the shunt switch operable to be dynamically modulated during the linear regulation mode (see Bullock, column 17 lines 26-38 and column 17 line 56 – column 18 line 9).

Referring to claim 62, Bullock teaches a first switch and a second switch coupled with the supply rail, the first switch selectively enabled to provide a conductive path to ground and the second switch selectively enabled to conduct when a voltage at the first switch is greater than a voltage of the supply rail (see Bullock, column 17 lines 56-66).

Referring to claims 63 and 73, Bullock teaches an energy storage device coupled with the supply rail, the energy storage device operable to selectively receive a charging current to maintain a determined voltage on the supply rail (see Bullock, column 14 lines 36-61).

Referring to claim 64, Bullock teaches a compensation overload detection circuit operable to provide the microprocessor an indication when the compensation circuit is no longer compensating for all of the magnetization losses in the secondary core (see Bullock, column 18 lines 41-53).

Referring to claim 67, Bullock teaches current monitoring circuit that includes a secondary coil sensing current transformer coupled with the power coil, the current

monitoring circuit operable to generate a voltage representative of the output current (see Bullock, column 5 lines 54-63).

Referring to claims 68 and 76, Bullock teaches that the supply rail is operable to supply power to the auxiliary power terminal for use external to the apparatus (see Bullock, column 10 line 59 – column 11 line 3).

Referring to claim 71, Bullock teaches a bridge rectifier coupled between the power coil and the power amplifier circuit, the bridge rectifier operable to rectify the output current (see Bullock, column 18 lines 2-9).

Referring to claim 74, Bullock teaches a switched capacitor circuit coupled with the energy storage device, wherein the switched capacitor circuit is operable to generated a predetermined negative voltage on a negative rail and a predetermined positive voltage on a positive rail from the determined voltage of the energy storage device (see Bullock, column 17 line 56 – column 18 line 9 and column 18 lines 32-40).

Referring to claim 75, Bullock teaches that the shunt switch comprises a semiconductor device (see Bullock, column 17 lines 56-60) and the energy storage device comprises a capacitor (see Bullock, column 19 lines 18-32).

Allowable Subject Matter

5. Claims 19, 22, 23, 65 and 66 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments filed 27 January 2006 have been fully considered but they are not persuasive.

Applicant argues that Bullock does not teach a secondary winding which powers power supply circuitry; however, Applicant's arguments are not well taken. It is not clear from the claimed language if the secondary winding is actually supplying the power to the circuit or if the winding is acting simply as a sensor to determine if the power supply is operational. Therefore, Bullock teaches power supply circuitry set within said enclosure, said power supply circuitry powered through said secondary winding from said powering current transformer and operative to supply power to said amplifier (see Bullock, column 7 lines 53-65).

Applicant further argues that Bullock does not teach an amplifier coupled with said active current transformer and operative to reduce the phase shift and ratio error between said current and said scaled version of said current; however, Applicant's arguments are not well taken. Bullock teaches an amplifier connected to the secondary winding of the current comparator transformer (see Bullock, Figure 1 and column 7 lines 54-65), provides a scaled output current to the current divider (see Bullock, column 5

lines 54-63), and via the current divider reduces the current ratio and the phase error between the input current and a scaled output current (see Bullock, column 5 lines 35-42).

Applicant further argues that Bullock does not teach power supply circuitry set within said enclosure, said power supply circuitry operative to extract power flowing within a second range of frequencies through said at least one of secondary leads and secondary terminals, said power supply circuitry operative to supply power to said amplifier; however, Applicant's arguments are not well taken. Bullock teaches a device, connected to a power supply (see Bullock, column 11 lines 42-47), which allows the device to determine various parameters such as current, voltage and power (see Bullock, column 18 lines 2-40). Therefore, Bullock teaches power supply circuitry set within said enclosure, said power supply circuitry operative to extract power flowing within a second range of frequencies through said at least one of secondary leads and secondary terminals, said power supply circuitry operative to supply power to said amplifier (see Bullock, column 17 line 56 – column 18 line 40).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP§706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Kate B. Baran whose telephone number is (571) 272-2211. The examiner can normally be reached on Monday - Friday from 9:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571) 272-2216. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

10 April 2006

MARC S. HOFF
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